

# 1

## INTRODUCTION

**TODO** Recent papers first. Mention Workshops instead in conference. "Proceedings of XXXX". Add the pages in the papers list.

### 1.1 Background

**TODO** Motivate with the open challenges.

### 1.2 Problem statement

**TODO** Problem statement **TODO** Set the requirements as R1, R2, then map each contribution to them.

### 1.3 Automatic Software diversification requirements

1. 1: **TODO** Requirement 1

### 1.4 List of contributions

**C1:** Methodology contribution: We propose a methodology for generating software diversification for WebAssembly and the assessment of the generated diversity.

**C2:** Theoretical contribution: We propose theoretical foundation in order to improve Software Diversification for WebAssembly.

**C3:** Automatic diversity generation for WebAssembly: We generate WebAssembly program variants.

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Contribution	Research papers				
	P1	P2	P3	P4	P5
C1	x	x		x	x
C2	x	x			
C3	x	x	x		
C4	x	x	x		
C5			x		
C6	x	x	x	x	x

**Table 1.1:** Mapping of the contributions to the research papers appended to this thesis.

- C4:** Software Diversity for Defensive Purposes: We assess how generated WebAssembly program variants could be used for defensive purposes.
- C5:** Software Diversity for Offensive Purposes: We assess how generated WebAssembly program variants could be used for offensive purposes, yet improving security systems.
- C6:** Software Artifacts: We provide software artifacts for the research community to reproduce our results.

**TODO** Make multi column table

## 1.5 Summary of research papers

- P1:** Superoptimization of WebAssembly Bytecode.
- P2:** CROW: Code randomization for WebAssembly bytecode.
- P3:** Multivariant execution at the Edge.
- P4:** Wasm-mutate: Fast and efficient software diversification for WebAssembly.
- P5:** WebAssembly Diversification for Malware evasion.

## 1.6 Thesis outline